

**ATTITUDES TOWARD AGRICULTURE  
AND FOOD SAFETY  
AMONG MISSOURIANS  
2003**

**Presented by:  
Missouri Department of Agriculture  
University of Missouri - Columbia**

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### Project Committee Members:

Carol Anderson, Fleishman-Hillard  
 Karla Deaver, University Outreach & Extension  
 Katana Ewbank, Brighton USA  
 Cynthia Fauser, University Outreach & Extension  
 Ken Fleming, University of Missouri  
 Sue Rourk King, USDA-Farm Service Agency  
 Sally Oxenhandler, Missouri Department of Agriculture  
 Karen Prunte, Spaeth Communications  
 Dr. Rex Ricketts, Commercial Agriculture  
 Mary Ellen Roth, Consultant  
 Dr. Bill Stringer, Consultant  
 Cheri Willett, Missouri Department of Agriculture  
 Loyd Wilson, Missouri Department of Agriculture  
 Marla Young, Missouri Department of Agriculture

## ***EXECUTIVE SUMMARY***

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United States citizens continue to have access to the safest and most abundant food supply in the world. Despite a steady increase in convenience purchases and food eaten away from home, strong growth in disposable income over the years, combined with the productivity of American farms allows U.S. citizens to pay proportionally less for food than any country in the world. In 2002, an average of 10.1% of U.S. household disposable income was spent for food, compared to 14% in Europe, 21% in Japan, and about 48% in China.

Missouri farms produce about \$4.4 billion in raw materials a year - crops, livestock, poultry and aquaculture. Livestock and poultry accounted for about 52 % of the agricultural output in 2002, while crops made up the other 48 %. Agricultural products stimulate transportation, processing, and production businesses across the state resulting in about a \$17.5 billion gross output. Missouri's 107,000 farmers supply food and fiber for over 5.5 million Missourians. In addition, the industry employs one of every 6.6 workers in Missouri.

Dramatic changes in farming practices are responsible for the safe, diverse, and plentiful food supply we enjoy. But public perceptions of farming have not kept pace with realities. However, if consumers do not understand the value of the industry that gives them their food and fiber, it could jeopardize resources available to producers and negatively impact public policy on agriculture. This comes to light when food issues focus public attention on farming practices, and it becomes apparent that modern farms differ significantly from our collective memories.

As a result, consumer concerns often focus on production-related issues, such as biotechnology, pesticide, hormone and chemical use as shown in a 2002 survey commissioned by the American Farm Bureau. The issue of food safety and quality has also drawn increasing attention from the media and consumers. Media coverage lends itself to large food recalls. Centers for Disease Control (CDC) notes that reported outbreaks represent "only a small fraction of the total number that occur." Individual cases of foodborne illness usually go undiagnosed and unreported. As a result, consumers tend to focus their concerns more on how food is handled prior to purchase than how they handle it in the home. Despite expressing confidence in their own food handling practices and acknowledging their own responsibility for keeping food safe, focus group discussions and observations reveal that some participants unknowingly follow unsafe practices at home.

A network of local, state, federal and international agencies share responsibility for the safety of our food supply with producers and consumers. The federal system alone consists of 35 different laws and involves 12 agencies. This system forms one of the most thorough and effective food safety networks in the world. Collectively these agencies establish safety standards on chemicals, technologies or practices; monitor and inspect food and food processes from farm to table; enforce safety standards through quarantine, plant shut downs, penalties and prosecution; and track food safety problems.

Many of these same agencies are also responsible for educating the public about the impact of agriculture on their daily lives. The significance of addressing these concerns applies to consumers and agricultural producers alike. Because of the impact of food safety and other agriculture concerns on Missouri farmers and consumers, the Missouri Department of Agriculture and the University of Missouri Commercial Agriculture Department funded a project to determine Missourians' perceptions of agriculture and food safety. The project built on two

previous statewide food safety consumer opinion surveys funded by the University of Missouri Commercial Agriculture conducted in June 1993 and August 1995 and added components to determine consumer awareness activities and opinions about agriculture. The Public Policy Research Center of the University of Missouri-St. Louis conducted the first two surveys. The third survey was conducted by the Center for Advanced Social Research, University of Missouri – Columbia.

The surveys were conducted via telephone using randomly generated numbers. Both the 1993 and 1995 surveys addressed a wide variety of issues and concerns dealing with food safety. There were specific items that required respondents to report where they get their food, methods they used to select food items, concerns about the processing and preparation of different foods and knowledge about the technology used in food cultivation and processing. Additionally, the 1995 survey included specific items dealing with knowledge of the use of biotechnology by the food industry, and willingness to consume food produced using this technology.

The 2003 survey went beyond attitudes about food safety to include agricultural topics such as general knowledge of agriculture, educational responsibility, and evaluation of farming practices. The type of respondent also changed somewhat in 2003. Whereas the primary food shopper in the household was asked to respond to the 1993 and 1995 surveys, the 2003 design used the Troidahl-Carter-Bryant (T-C-B) respondent selection method to select an eligible adult for the interview, resulting in a more balanced sample representative of the U.S Census Bureau's statistics on Missouri. Still, 71% described themselves as the primary food purchaser.

## **Summary of trends**

The completion of the 2003 survey marks a decade of tracking Missouri consumer opinions about agriculture and food-related issues. The 1993 survey established a baseline of data related to food safety concerns, information sources and shopping habits. The 1995 survey added to our knowledge base in these areas and included impressions about biotechnology. The 2003 survey also covered the topics of farming practices, general knowledge of agriculture and educational responsibility.

There are several interesting trends to note over the 10-year period. As expected, the primary source of food continues to be the supermarket. However, farmers' markets, home gardens and fast food are on the increase. Health continues to be the most important factor influencing food purchases, followed by taste and price. The rank of these factors has remained the same in each of the three surveys.

Food labels continue to be the primary source of food and nutrition information. Broadcast and print media are the secondary sources of information, a trend that has remained steady over the past 10 years. Since 1995, however, the internet has become a source of information for approximately 50 % of those surveyed.

While more than 80 % of those surveyed believe the food supply is very or somewhat safe, Missouri consumers continue to be most concerned about food handling and storage in restaurants and supermarkets. This area of concern ranked the highest in all three surveys. When it comes to learning about food safety, consumers continue to get most of their information from a variety of broadcast and print media.

Generally speaking, Missouri consumers are more informed now than in 1995 about biotechnology and its use in food production. While many still have concerns about this

practice, there is much greater acceptance than in 1995. Ninety-seven percent were extremely or somewhat concerned about this practice in 1995, compared to 50 % in 2003. The percentage of those not at all concerned grew from less than one percent in 1995 to 14% in the most recent survey.

Most Missouri consumers have a realistic definition of agriculture. Those surveyed generally have a positive perception of farmers and their food production practices. More than three-fourths of respondents felt farmers did a good, very good or excellent job of providing quality and plentiful food, being a responsible neighbor, caring for animals and using technology. More than 90 % of those surveyed felt it was important for Missouri children to know how their food is produced. Trends cannot yet be identified in this category, as it was new to the 2003 survey.

Finally, it is evident that there continues to be a need to educate consumers about agriculture. First-hand farm experiences continue to decline further contributing to the knowledge gap of agricultural practices. Through a comprehensive awareness and education effort, this important industry to Missouri will continue to prosper.

## ***METHODOLOGY***

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### **Sampling methodology**

The 2003 Attitudes Toward Agriculture and Food Safety Among Missourians was based on a simple random sample of residential households in the entire state. The sample represented Missouri's population using the U.S. 2000 Census Bureau's statistics in terms of demographic measures. The random digit aspect of the sample was used to avoid response bias and to provide representation of both listed and unlisted numbers (including not-yet-listed numbers).

### **Respondent selection method**

The Trol Dahl-Carter-Bryant (T-C-B) respondent selection method was used to define eligible respondents from the households randomly selected for the study. The T-C-B method helps to achieve a balance of males and females, younger and older adults in the sample.

### **Field operations**

At least eight attempts were made to complete an interview at every sampled telephone number. The calls were scheduled over days of the week to maximize the chances of making a contact with a potential respondent. All refusals were re-contacted at least once to attempt to convert them to completed interviews.

Five hundred twenty-four (524) interviews were completed via telephone from June 12 to July 21, 2003, by the trained interviewing and supervising staff of the Center for Advanced Social Research (CASR) of the University of Missouri's School of Journalism. The response rate of the survey was 43.8 %.

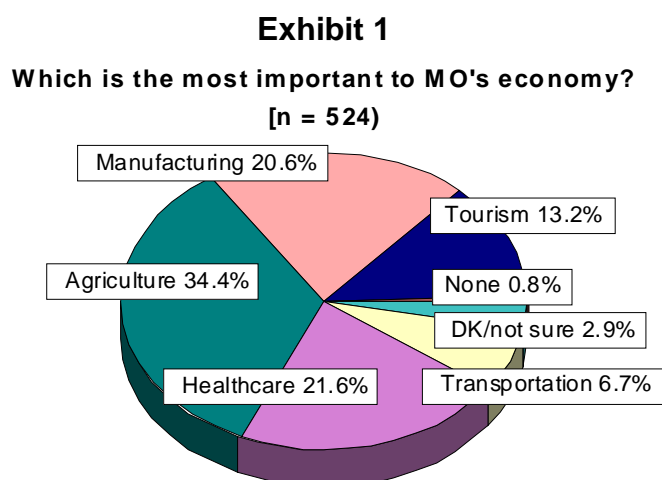
## ***SUMMARY OF FINDINGS***

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### **Perceptions of agriculture**

As shown below in Exhibit 1, when asked to point out the most important industry to Missouri's economy given the choices of tourism, health care, agriculture, manufacturing, and transportation, 34 % of the respondents thought it was agriculture, 22 % mentioned health care, 21 % manufacturing, 13 % tourism, and about seven percent thought it was transportation. Area of residence was not a significant factor in these answers.

Furthermore, respondents demonstrated an accurate perception of agriculture, defining agriculture as farms, livestock and crops.

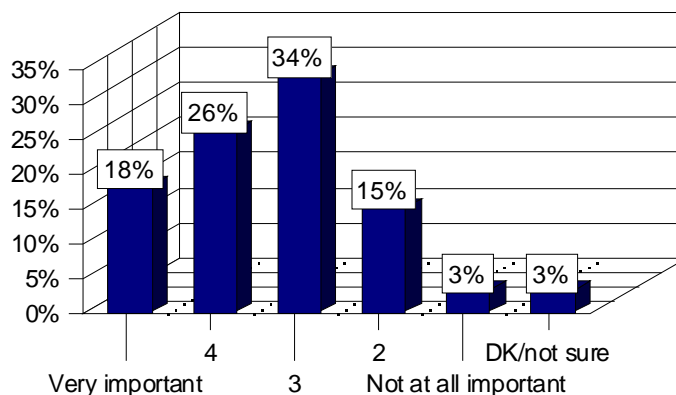


Considering that only about 2% of the population is directly involved with production agriculture, the fact that agriculture was identified most often demonstrates a significant awareness level. However, room for improvement in awareness is evident among the 64% who named other industries.

Agriculture's total economic impact, including its relationship to employment in the state, was less apparent to respondents than its rank among industries. While more than 78% believed agriculture had at least some importance to employment, only 18% felt it was very important to creating employment (Exhibit 2).

## Exhibit 2

**How important is agriculture in Missouri to creating employment? (n=524)**

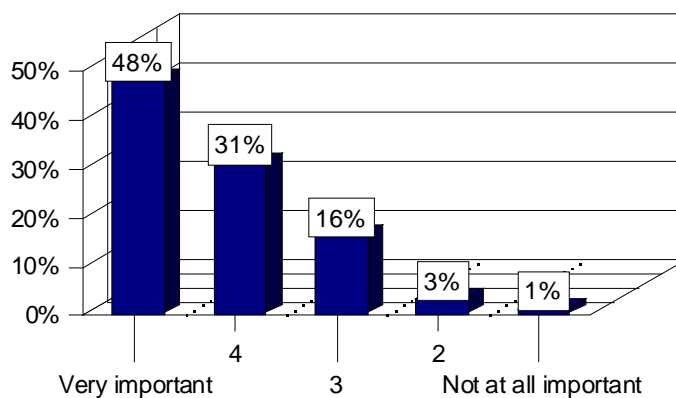


People living in rural areas and small towns agreed that agriculture is very important for employment opportunities in Missouri more than people who lived in large cities. Income was inversely related to viewing agriculture as important to employment.

Poor recognition of agriculture's importance in creating employment may be one reason why most did not recognize agriculture as the most important industry and why one third of respondents did not connect the importance of agriculture to daily life. The relevance to a steady food supply is more apparent (Exhibit 3).

## Exhibit 3

**How important is agriculture in Missouri to providing a steady food supply? (n=519)**



## Perceptions of farming practices

Respondents were asked about their perceptions of farming practices in Missouri. In general, they had a positive perception of farmers' abilities in providing quality and plentiful food, being responsible neighbors, using technology, and caring for animals. Less confidence

was expressed about farmer practices related to protecting the environment and using chemicals. Exhibit 4 summarizes the percent of respondents ranking farm practices as “good” or above.

#### **Exhibit 4**

<b>Percent “good” or above</b>	
Food quality	89%
Food quantity	85%
Responsible neighbor	85%
Care of animals	80%
Use of technology	75%
Protect the environment	63%
Use of chemicals	47%

People living in rural areas and small towns were more likely to believe that farmers in Missouri have done either an excellent or a very good job in being a responsible neighbor, compared with the views of people living in large cities.

Likewise, people living in rural areas/small towns agreed more than people in large cities that farmers in Missouri have done either an excellent or very good job in using chemicals. Comfort with farm chemical use is correlated with overall rating of food safety. Those who rate their food supply as “very safe” also rated farm use of chemicals as “very good” more than those who thought their food supply was not safe.

### **Views on education about agriculture**

Ninety-three percent of the respondents either strongly or somewhat agreed "it is important for children in Missouri to know how their food is produced." Similarly, an overwhelming majority of the people surveyed (93.6%) either strongly or somewhat agreed "it is important to educate people in Missouri about agriculture."

As for who should be responsible for educating children in Missouri about agriculture, 42% of the respondents pointed to "school system/teachers," 19 % mentioned "parents/family," 19% "parents and school," seven percent "local, state, and national government," and about six percent "everyone."

### **Sources of food**

As one might expect, 91 % of the respondents got most of their food from the supermarket. When asked about their second major source of food, 24 % of the respondents mentioned "farmers' market/roadside stands," 17 % from their own garden, 15 % from "restaurant/fast food" and 11 % from "supermarket." It is significant to note that farmers' markets named as secondary sources increased over the 1995 survey and that mention of fast food/restaurants increased from 2.9% in 1995 to 15.3% in the current survey (Exhibit 5).

**Exhibit 5**  
**Significant trends in secondary food sources**

	1993	1995	2003	Change
Farmer's market	15.3%	15.8%	23.7%	+7.9%
Fast food	2.7%	2.9%	15.3%	+12.4%

Given today's busy lifestyles, respondents reported eating out frequently. On average, the people surveyed would eat meals not served at home about three times in a typical week. More specifically, 24% would eat out once a week, 20% twice a week, 15% three times a week, and 32% four or more times in a week. About nine percent do not eat out.

### **Important factors in buying food**

Respondents were asked to indicate the importance of a list of factors that are believed to influence food purchasing. Factors included are shown in Exhibit 6 below.

**Exhibit 6**  
**Factors Influencing Buying Decisions**

Factor	% Very Important (N=524)
Health	67.9%
Taste	65.1%
Appearance	55.5%
Price	52.1%
Knowing country of origin	40%
Convenience	30%
Missouri Grown	23%
Organic	10%

Country of origin labeling, a new addition to the 2003 survey, made a strong showing. This was possibly due to recent news reports of Bovine spongiform encephalopathy (BSE) in Canada, or a perception of less stringent food safety practices in other countries, such as concerns about residues on imported produce.

When asked which factor was MOST important, 41 % of the respondents thought "health" was most important to them, about 18 % mentioned "taste," and 14 % "price" (Exhibit 7). Health, taste and price were listed in the same order in the 1993 and 1995 surveys.

**Exhibit 7**  
**Of all the factors listed above, which is most important to you?**

<b>Description of categories</b>	<b>Percent (%)</b>
Health	40.8%
Taste	17.6%
Price	14.3%
Appearance of food	8.4%
Knowing food's country of origin	7.8%
Convenience	4.4%
Seeking organic products	1.9%
Seeking Missouri products	1.5%
Don't know/Not sure	3.2%

(N=524)

**Sources of food and nutrition information**

Respondents were asked to rate the amount of information concerning food and nutrition they receive from various sources. Exhibit 8 summarizes the percentages of respondents who reported receiving “a lot” of information from these specific sources.

**Exhibit 8**  
**Sources of Information for Food & Nutrition Information**

<b>Sources</b>	<b>% Who Obtain A Lot of Information 1993 (N=510)</b>	<b>% Who Obtain A Lot of Information 1995 (N=513)</b>	<b>% Who Obtain A Lot of Information 2003 (N=524)</b>
Food Labels	51.4%	47.2%	50.6%
Television	30.0%	28.5%	n.a.
Television News	n.a.	n.a.	20.8%
Food Ads on TV	n.a.	n.a.	19.7%
Magazines	24.1%	22.6%	18.5%
Books	20.0%	22.4%	20.0%
Newspapers	20.6%	20.1%	21.0%
Doctors	18.0%	17.0%	11.8%
Other health professionals	13.9%	13.8%	14.5%
Friends/Relatives	15.5%	13.6%	19.7%
The Internet	n.a.	n.a.	12.4%
Nurses	13.9%	11.3%	9.5%
Radio	9.8%	8.0%	6.1%
Extension Publications	7.1%	8.0%	9.2%
Adult Ed./Extension Courses	2.0%	5.1%	4.0%

Food labels and mass media (specifically television, magazines, and newspapers) continue to provide respondents with most of their food and nutrition information. The friends and relatives category showed some increase, while the doctors and nurses categories showed some decline. The earlier “Television” category was split into news and advertising to better define the source. The Internet was a new addition to the 2003 survey. Thirty-nine percent received at least some food and nutrition information from the Internet.

## Perceptions of food safety issues

Respondents were asked how much they had heard about food safety issues in the past few months from the media, friends, and/or relatives. Twenty-eight percent of the respondents had heard a lot about food safety either in the media or from friends and relatives in the past few months, 40 % “some,” 25 % “not much,” and seven percent “nothing at all.”

The survey also shows the majority of the people (89%) believed their food supply was either very or somewhat safe.

When asked who has primary responsibility for the safety of the food supply, nearly 41 % of the people surveyed thought government agencies such as FDA, USDA, and their inspectors should be primarily responsible for the safety of the public food supply, 32 % mentioned “producer/grower/farmer,” and nine percent “processor/packager” (Exhibit 9). The number selecting producer/grower increased from 16% in 1995 to 32% in 2003. In the first two surveys, “supplier” ranked third, instead of processor/packager as in the current survey.

**Exhibit 9**  
**Who is primarily responsible for safety of food supply?**  
(n=524)

<b>Description of categories</b>	<b>Percent (%)</b>
Government such as FDA, USDA, etc.	40.8
Producer/Grower/Farmer	31.9
Processor/Packager	9.2
Supplier such as restaurant/supermarket	4.6
Consumer	1.5
Everyone	3.2
Others	5.2
Don't know/Not sure	3.6

## Awareness of food safety incidents

Awareness of food safety incidents was similar in all three surveys. About two-thirds of the respondents (67.6%) of the 2003 survey were able to recall a problem they had experienced or had heard about regarding food safety within the past few years compared to 70% in 1993 and 61% in 1995.

In 2003, problems mentioned most frequently were unsafe meat, Mad Cow Disease/Canadian beef, E. coli, Salmonella, fast food/restaurants and pesticides/chemicals (Exhibit 10). The age of the respondents had a significant effect on the amount of awareness about food safety, with middle-aged and older adults having heard about the issue more than younger adults. Rural Missourians were also more likely to be aware than those living in other areas.

**Exhibit 10**  
**What kind of food safety problem do you recall?**

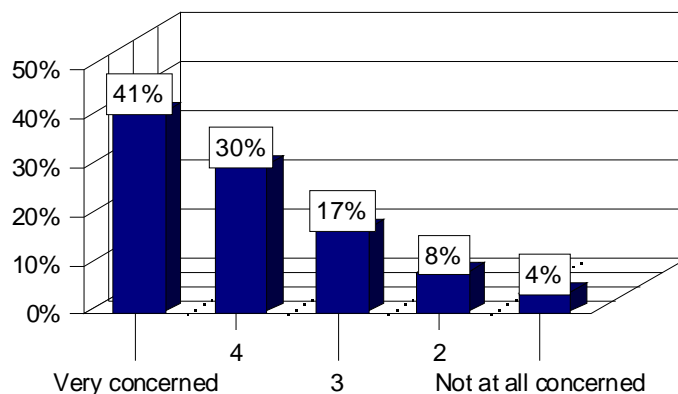
Description of categories	Percent (%)
Unsafe meat	21.8
Mad Cow disease/Canadian beef	17.3
Ecoli	13.6
Fast food/Restaurant	8.5
Salmonella	8.2
Pesticides/Chemicals	4.2

Not surprisingly, television and newspapers were the most cited sources of information about food safety in all three surveys.

### Areas of concern about food safety

To assess the level of concerns about food safety in both specific and general areas, respondents were asked to express their opinions on a 5-point scale with "1" being "not at all concerned" and "5" being "very concerned." Forty-one percent reported being very concerned (Exhibit 11).

**Exhibit 11**  
**Overall, how would you describe your level of concern with food safety? [n=523]**



The addition of a "neutral" option in the 2003 survey makes direct comparison to earlier

surveys more difficult and accounts for most of the differences in the percentages of “very concerned” in Exhibit 12. Still, it is apparent by rank that food handling and storage in restaurant and supermarkets and refrigeration of foods continue to represent the largest concern, followed by use of growth enhancers in livestock, and pesticides. Food safety in the home dropped from fourth to fifth place in the 2003 survey.

**Exhibit 12**  
**Areas of Concern for Food Safety**

<b>Areas</b>	<b>% Very Concerned 1993 (N=510)</b>	<b>% Very Concerned 1995 (N=513)</b>	<b>% Very Concerned 2003 (N=524)</b>
Food handling & storage in restaurants & supermarkets	77.1%	77.4%	66.4%
Refrigeration of foods	72.5%	73.5%	57.4%
Beef & poultry produced with growth enhancers	52.0%	54.8%	49.4%
Pesticides	61.8%	72.1%	47.7%
Food handling in the home	58.2%	57.1%	44.1%
Antibiotics in livestock & poultry production	46.7%	51.7%	43.3%
Genetically changing foods	36.1%	40.0%	42.4%
Additives in processed foods	45.5%	48/1%	39.5%
Irradiation	44.3%	51.3%	38.7%
Changing nutritional value of foods during processing	41.6%	41.5%	35.3%
Products that increase milk production	35.7%	47.0%	34.7%
Food preservatives	41.4%	39.8%	33.2%

It is encouraging to note that at most levels consumers correctly prioritize microbiologically related food safety concerns at the top of the list because, in fact, microbiological risks are of greatest concern to food scientists. It may also be worthwhile to note that respondents’ opinions are becoming more formed on some issues. The numbers responding “don’t know” dropped from around 5.5% to less than 2% for genetically changing foods and products that improve milk production. The “don’t know” category decreased from 11.7% to 4.6% for irradiation.

When asked what they were MOST concerned about, "food handling and storage in restaurants or supermarkets" was mentioned most (34.9%). About 11% of the people ranked "livestock, poultry, and food produced with growth enhancers" first, and 9% "pesticides" (Exhibit 13).

Compared to the earlier surveys, food handling and storage in restaurants has consistently been ranked the number one concern, with percentages near or above 30%. Pesticides ranked about 17% in both the 1993 and 1995 surveys, but dropped to 9.4% in 2003. Livestock produced with growth enhancers reflects levels closer to the 1993 survey (8.4%) than the 1995 level of

5.8%. Food handling in the home is the only area within consumer control, which may account for why concern is less than in areas over which they have no control. In contrast, food safety experts' assess that home food handling practices are a major contributor to foodborne illness. As in earlier surveys, concerns are most likely to be noticed after seeing something in the media (21.2%), during or after shopping (15.1%) or after someone in the family gets sick (11.8%).

**Exhibit 13**  
**Area of Most Concern**

<b>Areas</b>	<b>1993 (n=510)</b>	<b>1995 (n=513)</b>	<b>2003 (n=524)</b>
Food handling and storage in restaurants and supermarkets	33.5%	29.4%	34.9%
Beef or poultry raised and food produced with growth enhancers	8.4%	5.8%	10.5%
Pesticides	16.9%	17.2%	9.4%
Genetically changing foods	2.4%	4.1%	7.3%
Antibiotics in livestock and poultry production	4.3%	4.1%	5.9%
Additives in processed foods	6.5%	3.9-4.9%	5.7%
All of the above	1.6%	0.4%	4.0%
Food handling in the home	3.3%	3.1%	3.8%
Irradiation	4.5%	5.8%	3.4%
Food preservatives	2.5%	4.5%	2.5%
Changing the nutritional value of food during processing	2.2%	2.3%	2.3%
Refrigeration of food	6.3%	6.0%	2.1%
Products that increase milk production	1.2%	2.7%	0.8%

## **Perceived effect of government regulations**

The majority (57.4%) reported they knew little about government regulations regarding food. Respondents were asked to rate the degree to which they believe government regulations have affected the food supply. Exhibit 14 shows the percentages of respondents who reported that government regulations have had an effect on various aspects of the food supply.

**Exhibit 14**  
**Effect of Government Regulations on:**

Increased:	% Who Thought Government Regulations Increased Aspect 1993 (n=510)	% Who Thought Government Regulations Increased Aspect 1995 (n=513)	% Who Thought Government Regulations Increased Aspect 2003 (n=524)
Cost	64.3%	73.5%	64.7%
Safety	56.7%	60.8%	74.2%
Quality	48.8%	46.8%	58.4%
Availability	24.3%	30.4%	33.2%

Most respondents felt government regulations within the food industry increased safety. This number has continued to rise over the three surveys. Respondents recognize that safety comes with a cost. Sixty-five percent feel government regulations increase cost. Most (58%) feel government regulation also improves quality, up from 47% in 1995 and 49% in 1993. Lastly, a smaller but increasing percentage (33%) feels government regulations improve availability.

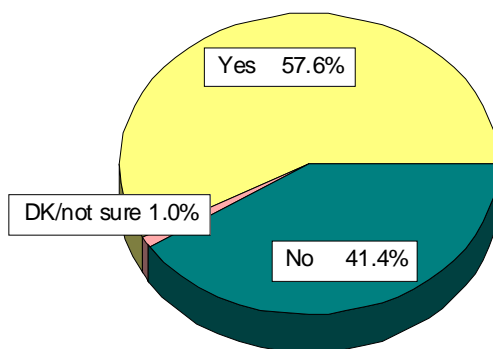
### Confidence in food

To ensure people's confidence in their food supply, 18% of the respondents felt "education" would be most important, 13 % "information and labeling", ten percent "handling and processing," and seven percent "tougher food safety regulations." In contrast, the 1995 survey respondents placed much more emphasis on tougher food safety regulations (27%).

### Use of biotechnology in food production

Nearly 58% of the respondents were aware that biotechnology had been used in the production of a variety of foods such as tomatoes, potatoes, milk and cheese. Forty-one percent were not (Exhibit 15). A broad mix of broadcast and print media made up nearly 70% of the primary information sources on this topic.

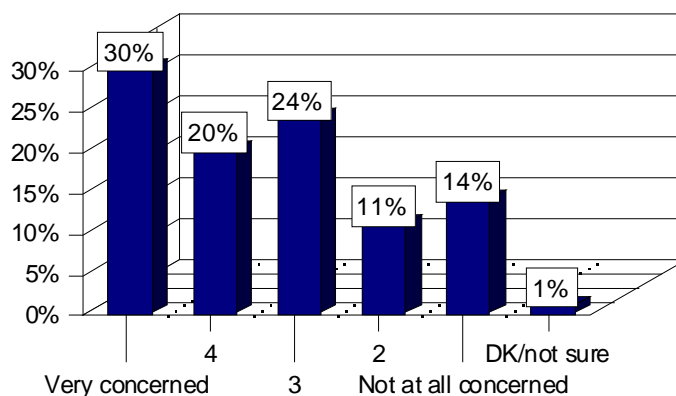
**Exhibit 15**  
**Have you heard about the use of  
biotechnology in food production? (n = 524)**



As shown in Exhibit 16, 50% of respondents were concerned or very concerned about bioengineered products. People with less education, those making \$30,000 or less annually, those in towns less than with populations of 50,000 people, and women were more likely to express concern about biotechnology.

**Exhibit 16**

**How concerned are you about biogenetically engineered products? [n=524]**



As noted in Exhibit 17, general uncertainties characterized nearly a third of the reasons as typified by one response, “I don’t really know why – the thought just scares me.” Concern about unknown long-term effects, and health concerns were also mentioned frequently.

**Exhibit 17**

**Could you tell me why you are concerned?**

Description of categories	Percent (%)
Don't know long-term effects	22.5
Don't know if need more information	10.1
It affects health/causes disease/cancer	17.1
It is unnatural	13.6
Others	33.7
Nothing in particular	3.1

(n=258)

## Concern for eating food produced using biotechnology

Exhibit 18 compares responses between 1995 and 2003 when asked to rate their level of concern about eating food produced through biotechnology “if biogenetically engineered products are equal or superior nutritionally to similar food products and the end result is lower consumer costs.” Women and those with a high school education or less were more likely to be concerned about eating food produced by biotechnology.

**Exhibit 18**  
**Concern About Eating Biogenetically Engineered Foods**

	<u>1995</u> (n=234)	<u>2003</u> (n=524]
Extremely concerned	35.9%	24.2%
Somewhat concerned	48.7%	16.4%
Neutral	n/a	24.8%
Not too concerned	9.8%	11.1%
Not at all concerned	2.6%	21.4%
Don't know	3.0%	2.1%

Although the addition of the neutral category in 2003 makes direct comparisons more difficult, there appears to be a trend toward reduced concern. While 41% indicated they were somewhat or very concerned, the rise in the “not at all concerned category” is notable.

### **Awareness of renewable fuel**

The survey shows that 73 % of the people were aware that there is a renewable fuel made from agricultural products. Awareness was higher in adults over 35, those with at least some college education, higher incomes, males, and rural residents.

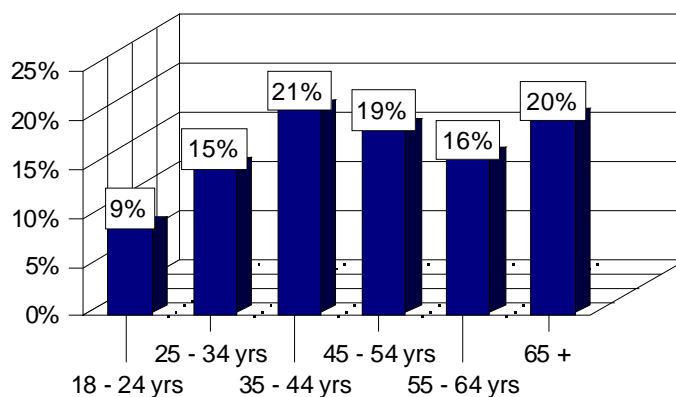
When asked whether they had purchased a renewable fuel for their automobiles, such as ethanol or bio-diesel, 37 % of the respondents said yes, 60 % no, and about three percent were either not sure or did not know. Older adults, those earning \$40,000 or more, males, and rural residents were more likely to purchase renewable fuels. These demographics may again represent awareness more than purchase practice. In urban air quality regions, such as St. Louis, all fuels contain 10% ethanol. In more rural areas, a higher octane choice with ethanol is available at the same price as the lower octane choice without ethanol. This would tend to raise the awareness of the purchase of renewable fuels.

## Demographics

In the end of the survey, demographic information about age, education, ethnicity, income, county, zip code, gender, etc. were collected from the respondents. The purpose was to obtain a comprehensive profile of the survey participants for better understanding of the survey results.

The age groups of the 524 respondents are presented in Exhibit 19. The average age was 47.7 years.

**Exhibit 19**  
**Age Groups**  
(n = 522)



**Exhibit 20**  
**Level of Education**

Level of Education	Percent (%)
Less than high school	7.9
High school / GED	28.2
Some college	19.7
Trade or technical school	3.1
2-year associate degree/community college	6.9
College degree	19.7
Some graduate school, no degree	2.7
Graduate degree	11.6
DK/not sure/refused	0.4

(n=524)

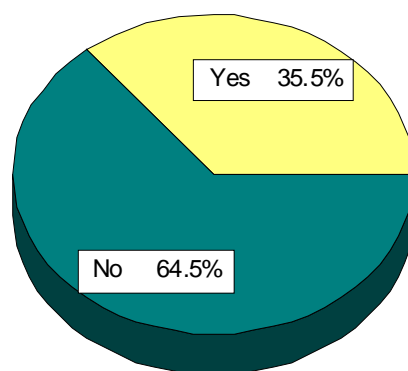
**Exhibit 21**  
**Line of Work**

<b>Description</b>	<b>Percent (%)</b>
Professional	37.4
Technical	13.2
Self-employed	5.9
Homemaker	4.2
Retired	18.3
Student	3.6
Service worker	7.3
Farmer/Agriculture	3.2
Not currently employed	2.7
Disabled	1.7
Others	2.3
Don't know/Not sure	0.2

(n=524)

**Exhibit 22**

**Are there children under 18 living  
in your household? (n = 524)**



**Exhibit 23**  
**Ethnicity**

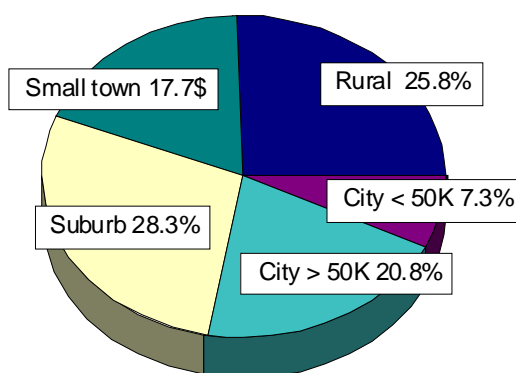
Description of categories	Percent (%)
White	88.2
African American	7.1
American Indian	1.0
Latino/Hispanic	0.6
Asian American	0.6
Others	2.1
DK/not sure/Refused	0.6

(n = 524)

**Exhibit 24**

**Describe the area in which you live**

(n = 524)



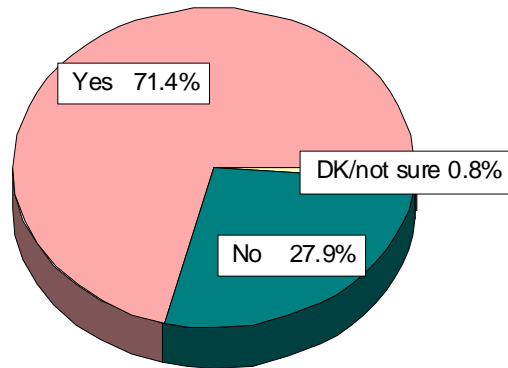
**Exhibit 25**  
**Household Income**

Categories of Income	Percent (%)
Less than \$12,000	6.5
\$12,000 but less than \$20,000	8.4
\$20,000 but less than \$30,000	13.7
\$30,000 but less than \$40,000	13.2
\$40,000 but less than \$50,000	10.9
\$50,000 but less than \$75,000	21.2
\$75,000 but less than \$100,000	9.2
\$100,000 or more	9.4
Don't know/not sure	2.1
Refused	7.6

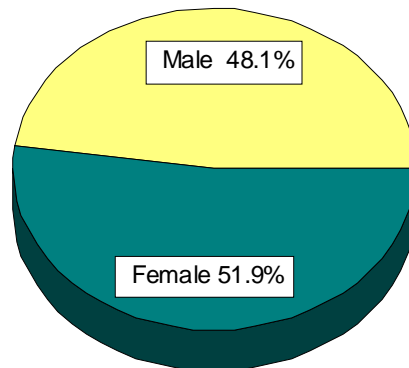
(n=524)

**Exhibit 26**

**Are you the person who purchases most  
of the food for your household? (n = 524)**

**Exhibit 27**

**Gender  
(n = 524)**



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**For additional copies of this summary:**  
**[www.mda.mo.gov](http://www.mda.mo.gov)**

**For more information about the survey and results:**

Cheri Willett  
Outreach Program Coordinator  
Market Information & Outreach Division  
Missouri Department of Agriculture  
Post Office Box 630  
Jefferson City, MO 65102  
573-751-2477  
573-751-2868 fax  
[Cheri.Willett@mda.mo.gov](mailto:Cheri.Willett@mda.mo.gov)

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